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10/059,401	01/31/2002	David K. Lambert	DP-301550	6074

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EXAMINER

SMITH, RICHARD A

ART UNIT	PAPER NUMBER
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2859

DATE MAILED: 10/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No. .

10/059,401

Applicant(s)

LAMBERT ET AL.

Examiner

R. Alexander Smith

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-34 and 36-48 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 17,31 and 47 is/are allowed.
- 6) ☒ Claim(s) 1,4-16,18-30,32-34,36-46 and 48 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

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2. Claims 1, 5-10, 14-16, 19, 21-24 and 28-30 are finally rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. 4,754,139 to Ennulat et al.

Ennulat et al. discloses an infrared sensor, including an absorber (4), a plurality of reflecting surfaces (on 1) disposed about the circumference of each absorber; the reflective surfaces define a light collecting region (9), each reflective surface being disposed at an obtuse angle relative to the light collecting region; a membrane (8) for thermally isolating the frame from the absorber, the membrane being supported by the frame and lying in the light collecting region and having the absorber disposed thereon; the detector extending between the frame and the absorber (by means of the detector itself and leads 11); reflective surfaces are coated with a metal film (column 4, lines 51-58 and in particular lines 57-58); the reflective surfaces define a cavity (9) having a substantially rectangular cross section; the reflective surfaces being disposed on a light concentrator (1); the light concentrator being micromachined and including 1st and 2nd parallel segments, a 3rd segment connected between one end of each 1st and 2nd segments and being at right angles, and a 4th segment connected between the other ends of each 1st and 2nd segment and being at right angles, the 4th segment being parallel to the 3rd segment (see 1 and 9 of figure 1); below a circuit board (3 with 2) having a void (14) and the absorber being disposed adjacent the void; the absorber being mounted to the membrane which spans the opening, each reflective surface having one edge adjacent the perimeter of the opening and an opposite edge offset outwardly from the perimeter of the opening; the frame defines a rectangular opening having a perimeter, the frame including four segments disposed about the perimeter wherein each

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segment has an inner side defining one of the reflective surfaces; the inner side extending from adjacent the perimeter of the opening to an apex of the triangular cross section. Ennulat et al. discloses that the detector of the present invention is compatible with any number of well-known thermal sensitive devices (column 3, lines 30-37) including thermocouples.

With respect to each of the segments includes an inward side and an outward side, the reflective surfaces being disposed on the inward side of the segments: Ennulat et al. discloses this limitation since for each absorber 4, the inward side would be those segments which bound that particular absorber in order to reflect light to that particular absorber, the outward segments would be those segments which face the edge of the circuit board or face another of the absorbers as shown in figure 1.

With respect to claimed limitations of I) the frame supporting the absorber and including the reflecting surfaces, ii) the frame includes a body for supporting the absorber and for attaching the light concentrator, iii) the frame being mounted to the circuit board, and iv) the frame defining an opening and including four side walls defining a cavity: Ennulat et al. discloses that the invention includes the light concentrators and a detector support structure for supporting the absorber and the relationship between these two must be maintained. Ennulat et al. further discloses that the light concentrator and detector support structure can be used within any number of well-known thermal sensitive devices (column 3, lines 30-37). Therefore, the generic limitations involving the frame, as claimed by Applicant, are considered by the Examiner as

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anticipated by Ennulat et al. since a frame to support the concentrators, the membrane and the absorber are inherently necessary.

With respect to the frame including a body for supporting the absorber: this limitation is met when the frame body supports the absorber indirectly via the integrated circuit 3 and the detector support structure 2, or when the frame body supports the absorber directly via inclusion of the integrated circuit 3 and the detector support structure 2.

With respect to claimed limitations of the frame being mounted to the circuit board, the frame defining an opening and including four side walls defining a cavity: these limitations are met when the frame includes the integrated circuit 3 and the detector support structure 2.

Ennulat et al. does not disclose the absorber being in a central region of the membrane and the micromachined light concentrator being of silicon.

With respect to the absorber being in a central region of the membrane: Ennulat et al. in figure 1 discloses a plurality of absorbers spaced apart on a membrane that spans a plurality of light collecting regions. In each cell, the absorber is centered with respect to light collecting region and the cavity in the frame body when the frame or frame body supports the absorber directly via inclusion of the integrated circuit 3 and the detector support structure 2 as stated above. Furthermore, Ennulat et al. discloses in another embodiment, i.e., figure 3, that each absorber can individually be supported by distinct sections of a membrane and centered in a light

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collecting region. Therefore, the absorber being in a central region, as claimed by Applicant, is considered to be equivalent to the absorber being in a central region for each light collecting region, as disclosed by Ennulat et al., since neither non-obvious nor unexpected results, i.e., results which are different in kind and not in degree from the results of the prior art, will be obtained if one is used instead of the other, as long as the absorber is centered with respect to the light collecting region and is isolated so to have a uniform thermal profile, as already taught by Ennulat et al.

With respect the light concentrator being silicon: The Applicant's limitations regarding micromachined light concentrator being of silicon is only considered to be the use of "optimum" or "preferred" materials that a person having ordinary skill in the art at the time the invention was made using routine experimentation would have found obvious to provide to make the concentrator disclosed by Ennulat et al. since they are well known types of materials used to make circuit board related elements and since it has been held to be a matter of obvious design choice and within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use of the invention. In re Leshen, 125 USPQ 416. In this case, to use conventional techniques and materials for circuit board related construction.

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3. Claims 4, 20, 33, 34, 36-40 and 44-46 are finally rejected under 35 U.S.C. 103(a) as being unpatentable over Ennulat et al. as applied to claims 1, 5-10, 14-16, 19, 21-24 and 28-30 above and further in view of U.S. 6,335,478 to Chou et al.

Ennulat et al. teaches all that is claimed as discussed in the above rejections of claims 1, 5-10, 14-16, 19, 21-24 and 28-30 except for the thermocouple being a plurality of series connected thermocouples and each of the thermocouples having a Seebeck voltage which depends upon temperature difference and the micromachined light concentrator being of silicon.

Chou et al. discloses a thermocouple being a plurality of series connected thermocouples in order to increase the voltage generated and that each of the thermocouples have a Seebeck voltage which depends upon temperature difference are commonly available (column 1, lines 18-36). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the thermocouple absorber, taught by Ennulat et al., by making it a thermopile using Seebeck voltage, as taught by Chou et al., in order to increase the output voltage and to use commonly available thermocouples to save on costs.

With respect to the micromachined light concentrator being of silicon in claim 38: The Applicant's limitations regarding micromachined light concentrator being of silicon is only considered to be the use of "optimum" or "preferred" materials that a person having ordinary skill in the art at the time the invention was made using routine experimentation would have found obvious to provide to make the concentrator disclosed by Ennulat et al. since they are well known types of materials used to make circuit board related elements and since it has been held

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to be a matter of obvious design choice and within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use of the invention. In re Leshen, 125 USPQ 416. In this case, to use conventional techniques and materials for circuit board related construction.

4. Claims 11, 13, 18, 25, 27 and 32 are finally rejected under 35 U.S.C. 103(a) as being unpatentable over Ennulat et al. as applied to claims 1, 5-10, 14-16, 19, 21-24 and 28-30 above and further in view of U.S. 5,962,854 to Endo.

Ennulat et al. teaches all that is claimed as discussed in the above rejections of claims 1, 5-10, 14-16, 19, 21-24 and 28-30 except for a silicon window attached to the frame, extending between the reflective surfaces and enclosing the absorber; the silicon window extending between the side walls and being parallel to the bottom wall; a silicon window being mounted to the top surfaces of the segments.

Endo discloses that an infrared sensor having a silicon window and an antireflection coating on the window (column 18, lines 3-22) to enclose the area of the thermopile. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add the window and the antireflection coating, as suggested by Endo, to the sensor and its top surfaces, extending between the reflective surfaces and to enclose the absorber, taught by Ennulat et al., in

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order to protect the sensor from outside contaminants, to provide a surface for attaching an anti-reflective coating, and to minimize reflections.

5. Claims 41, 43 and 48 are finally rejected under 35 U.S.C. 103(a) as being unpatentable over Ennulat et al. and Chou et al. as applied to claims 4, 20, 33, 34, 36-40 and 44-46 above, and further in view of U.S. 5,962,854 to Endo.

Ennulat et al. and Chou et al. teach all that is claimed as discussed in the above rejections of claims 4, 20, 33-40 and 44-46 except for a silicon window attached to the frame, extending between the reflective surfaces and enclosing the absorber; the silicon window extending between the side walls and being parallel to the bottom wall; a silicon window being mounted to the top surfaces of the segments.

Endo discloses that an infrared sensor having a silicon window and an antireflection coating on the window (column 18, lines 3-22) to enclose the area of the thermopile. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add the window and the antireflection coating, as suggested by Endo, to the sensor and its top surfaces, extending between the reflective surfaces and to enclose the absorber, taught by Ennulat et al. and Chou et al., in order to protect the sensor from outside contaminants, to provide a surface for attaching an anti-reflective coating, and to minimize reflections.

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6. Claims 12 and 26 are finally rejected under 35 U.S.C. 103(a) as being unpatentable over Ennulat et al. and Endo as applied to claims 11, 13, 18, 25, 27 and 32 above, and further in view of U.S. 6,107,925 to Wong.

Ennulat et al. and Endo together teach all that is claimed as discussed in the above rejections of claims 11, 13, 18, 25, 27 and 32 except for an interference filter.

Wong discloses that an infrared sensor having a window with interference filters in order to allow the band of radiation desired through the window (column 18, lines 28-40). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add the interference filter, as suggested by Wong, to the inside of the window, taught by Ennulat et al. and Endo, in order to allow the bands of radiations desired through the window.

7. Claim 42 is finally rejected under 35 U.S.C. 103(a) as being unpatentable over Ennulat et al., Chou et al. and Endo as applied to claims 41, 43 and 48 above, and further in view of U.S. 6,107,925 to Wong.

Ennulat et al., Chou et al. and Endo together teach all that is claimed as discussed in the above rejections of claims 41, 43 and 48 except for an interference filter.

Wong discloses that an infrared sensor having a window with interference filters in order to allow the band of radiation desired through the window (column 18, lines 28-40). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add the

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interference filter, as suggested by Wong, to the inside of the window, taught by Ennulat et al., Chou et al. and Endo, in order to allow the bands of radiations desired through the window.

Response to Arguments

8. Applicant's arguments filed 21 July 2003 with respect to Ennulat et al., Chou et al., Endo, and Wong have been fully considered but they are not persuasive.

With respect to the arguments regarding the frame supporting the absorber and the reflective surfaces in a single structure and claims 1, 19 and 33: In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the frame supporting the absorber and the reflective surfaces in a single structure) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In clarification, the applicant should note that it appears to the examiner that the applicant is implying in the arguments that Ennulat et al. does not disclose each operating cell, i.e., the reflector, absorber, membrane, etc., as an entity into itself and directly connected to each other to form the frame. Although, the examiner would agree with this implied argument, it does not

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appear to the examiner that the limitations as stated in the claims disclose the argued features to overcome Ennulat et al., i.e., limitations from the specification are not read into the claims.

With respect to the membrane as a thermal buffer and the frame: these arguments are not persuasive for the reasons with respect to the frame as noted above.

With respect to the light collecting region and the membrane: these arguments are not persuasive since it appears to the examiner that the membrane of Ennulat et al. does lie in the light collecting region and meets the claimed limitations as modified in the rejection applied above. Although the features argued by the Applicant do not appear to the Examiner as being in the claims and therefore appear to be moot with respect to the claims, it is unclear as to how the applicant's argument clarifies the term "light collecting region." Is the region that is only exposed to direct light, the light collecting region? If claimed, then this would eliminate the membrane underneath the absorber in Ennulat et al., but what about the gap and light passing at an angle which falls outside the absorber and directly onto the membrane because of the gap? This appears to the examiner as also being a part of a light collecting region. Is the light collecting region the entire device or is it the area of the membrane and the absorber which actually receives light? Does this received light include light that is reflected off the reflective surfaces in addition to direct exposure?

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Furthermore, the applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., the membrane isolates the absorber from the reflective surfaces) are not recited in the rejected claim(s). Again, please see the reasons with respect to the frame as noted above.

With respect to Ennulat, Ennulat in view of Chou; Ennulat in view of Endo; Ennulat and Chou further in view of Endo; Ennulat and Chou further in view of Wong; and Ennulat, Chou and Endo further in view of Wong: In each of these rejections, Ennulat was used for the teaching of the claimed membrane arrangement and the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). In this case it would have been obvious to one of ordinary skill in the art, since Ennulat discloses for each cell, an absorber supported by the membrane wherein the absorber is centered with respect to the light collecting region, the underlying chamber, and the portion of the membrane that spans the respective cell (figure 1) and since Ennulat suggests in another embodiment (figure 3) that each absorber for each cell can have its own support and be centered thereon.

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Allowable Subject Matter

9. Claims 17, 31 and 47 are allowable.

10. As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be

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calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure. The prior art cited in PTO-892 and not mentioned above disclose related sensors.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Smith whose telephone number is (703) 305-0647. The examiner can normally be reached on Monday-Friday from 9:00 AM to 5:30 PM.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.



Diego Gutierrez
Supervisory Patent Examiner
Technology Center 2800

RAS
October 2, 2003